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**EXPLANATION OF SIGNIFICANT DIFFERENCE
SAUGET AREA 2 SUPERFUND SITE
ST. CLAIR COUNTY, ILLINOIS**

I. Introduction to the Sauget Area 2 Site and Statement of Purpose

This Explanation of Significant Difference (ESD) is required under CERCLA because, the lead agency, in this case, U.S. EPA, is proposing to change a remedy already public noticed in an agency Record of Decision (ROD). U.S. EPA issued this ROD in September 30, 2002, to implement an Interim Groundwater Control System at the Sauget Area 2 Site in Sauget and Cahokia, Illinois ("the Site"). The significant change discussed in this ESD involves a change to a single component of the remedy, does not fundamentally alter the overall cleanup approach, and complies with the National Contingency Plan (NCP) and statutory requirements of CERCLA, as explained in further detail below.

The following is a brief description of the source area sites that comprise the Sauget Area 2 Site: The Site covers approximately 312 acres and is located within the corporate boundaries of Cahokia, East St. Louis, and Sauget, Illinois, in the floodplain bordering the eastern edge of the Mississippi River. The Site is west of Route 3 (Mississippi Avenue) and north of Cargill Road and consists of five inactive disposal sites: source area sites O, P, Q, R, and S.

The Site is the location of a release of hazardous substances resulting from the disposal of industrial, municipal, and chemical wastes. These hazardous substances have been found in soils at the site, in groundwater beneath the site, in surface water and sediments, fish tissue, and in the Mississippi River adjacent to the Site, particularly in the vicinity of site R. The Site contains a number of source areas briefly described below.

- Site O, located on Mobile Avenue in Sauget, Illinois, occupies approximately 20 acres of land to the northeast of the American Bottoms Regional Wastewater Treatment Facility (ABRTF). An access road to the ABRTF runs through the middle of the site.
- Site P, which is bounded by the Illinois Central Gulf Railroad tracks, the Terminal Railroad Association tracks and Monsanto Avenue, occupies approximately 20 acres of land located in the City of East St. Louis and the Village of Sauget.
- Site Q, a former subsurface and surface disposal area, occupies approximately 90 acres in the Villages of Sauget and Cahokia. Site Q is divided by the Alton and Southern Railroad into a northern portion and a southern portion.

The northern portion of site Q consists of approximately 65 acres bordered on the north by site R and Monsanto Avenue. The northern portion is bordered on the south by the

main track of the Alton and Southern Railroad and property owned by Patgood, Inc. On the east, the northern portion of the site is bordered by the Illinois Gulf Central Railroad and the U.S. Army Corps of Engineers (USACE) flood control levee and on the west the site is bordered by the Mississippi River.

The southern portion of site Q consists of approximately 25 acres, north of Cargill Road and south of the Alton and Southern Railroad. The southern portion is bounded on the west by a 10-foot wide easement owned by Union Electric for transmission lines and a spur track of the Alton and Southern Railroad to the Fox Terminal. A barge terminal operated by St. Louis Grain Company is located between the Union Electric easement, the spur track and the Mississippi River. Southern site Q is bordered on the east by the Illinois Central Gulf Railroad and the flood control levee.

- Site R, a closed industrial-waste disposal area owned by Solutia, Inc. (and formerly Monsanto), is located between the flood control levee and the Mississippi River in Sauget, Illinois. Its northern border is Monsanto Avenue and its southern border is site Q. Site R is now known as the "River's Edge Landfill". The closed landfill occupies approximately 22 acres of the 36-acre. A portion of site Q, known as the "Dog Leg", is located to the east of site R.
- Site S, located southwest of site O, is a small disposal site less than one acre in size. The site is currently part of the American Bottoms Regional Wastewater Treatment Facility (ABRWTF). The northern portion of site S is grassed and the southern portion is covered with gravel. Access to the northern portion of site S is partially restricted in that the site is located on private property. Access to the southern portion of site S is restricted by fencing.

The United States Environmental Protection Agency (U.S. EPA) has determined that a significant change to the selected remedy described in the Interim Record of Decision (ROD), dated September 30, 2002, is warranted. Section 117(c) of CERCLA requires that:

After adoption of a final remedial action plan set forth in the ROD -

- (1) if any remedial action is taken,
- (2) if any enforcement action under section 106 is taken, or
- (3) if any settlement or consent decree under section 106 or section 122 is entered into,

and if such action, settlement, or decree differs in any significant respects from the final plan, the U.S. EPA shall publish an explanation of the significant differences (ESD) and the reasons such changes were made (42 U.S.C. § 9617(c)).

In this case, the U.S. EPA, after consultation with the Illinois EPA, is issuing this ESD to explain

and document modifications proposed to the Interim Groundwater Migration Control System required by the Interim ROD issued in this case. Specifically, the modification involves the use of a conventional soil-bentonite slurry wall barrier to be constructed down gradient of site R, instead of a jet grout wall barrier, which was the selected remedy in the Interim ROD.

This ESD document and all of the technical information and data relating to it shall become part of the administrative record for the Site, which is available for viewing, during normal business hours, at the Site information repository located at the Cahokia Public Library District, 140 Cahokia Park Drive, Cahokia, Illinois and at the U.S. EPA Region 5 Records Center located at 77 W. Jackson Boulevard, Chicago, Illinois.

II. Site History, Contamination, and Selected Remedy

A. Site History

Site O - In 1952, the Village of Sauget Waste Water Treatment Plant began operation at this location. In addition to providing treatment for the Village of Sauget, the plant treated effluent from the various Sauget industries. Site O consists of four closed lagoons constructed in 1965 at the Village of Sauget Wastewater Treatment Plant and placed into operation in 1966/1967. Between 1966/1967 and approximately 1978, these lagoons were used to dispose of clarifier sludge from the wastewater treatment plant. In 1980, the Village of Sauget closed four clarifier sludge lagoons at site O by stabilizing the sludge with lime and covering it with approximately two feet of clean, low-permeability soil. Currently, the lagoons are vegetated.

Site P - Operated by Sauget and Company from 1973 to approximately 1984, site P was an Illinois EPA-permitted landfill, accepting general wastes, including diatomaceous-earth filter cake from Edwin Cooper, and non-chemical wastes from Monsanto.

Site Q - Disposal started at site Q in the 1950s and continued until the 1970s. On information and belief, Sauget and Company started operation of a landfill south of the River Terminal in 1966 and terminated operations in 1973. This facility took various wastes, including municipal waste, septic tank pumpings, drums, organic and inorganic wastes, solvents, pesticides and paint sludges. It also took plant trash from Monsanto, waste from other industrial facilities and demolition debris. U.S. EPA conducted two response actions at site Q; one in 1995 to remove drums exposed in the riverbank in the southwestern portion of the site and another in 1999/2000 to remove drums (3,271) and soil (17,032 tons) from two ponds located in the southeast corner of the site.

Site R - Industrial Salvage and Disposal, Inc. operated the River's Edge Landfill for Monsanto from 1957 to 1977. Hazardous and non-hazardous bulk liquid and solid chemical wastes and drummed chemical wastes from Monsanto's W.G. Krummrich plant and, to a lesser degree, Monsanto's Queeny plant in St. Louis were disposed of at site R. Disposal began in the northern portion of the site and expanded southward. Wastes contained phenols, aromatic nitro

compounds, aromatic amines, aromatic nitro amines, chlorinated aromatic hydrocarbons, aromatic and aliphatic carboxylic acids and condensation products of these compounds. A two to eight foot thick clay cover was installed on site R in 1979 to cover the waste, limit infiltration through the landfill and prevent direct contact with the landfill material. In 1985, a 2,250 foot long rock revetment was installed along the bank of the Mississippi River down gradient of site R to prevent erosion of the riverbank and minimize the potential for the release of waste material from the landfill. On February 13, 1992, the State of Illinois and Monsanto signed a consent decree entered in St. Clair County Circuit Court requiring further remedial investigations and feasibility studies to be conducted by Monsanto on site R. The results of the Remedial Investigation/Feasibility Study were submitted to Illinois EPA in 1994.

Site S - In the mid-1960s, solvent recovery began on the Clayton Chemical property, which is now owned by the Resource Recovery Group. The waste solvents were steam-stripped resulting in still bottoms that were allegedly disposed of in a shallow, on-site excavation that is now designated site S. Historical aerial photographs indicate that site S was potentially a waste and/or drum disposal area.

Numerous investigations have been conducted at or near the Sauget Area 2 Site. In 1998, Ecology and Environment (E&E) prepared the report "Sauget Area 2 Data Tables/Maps on behalf of the U. S. EPA Region 5. This report summarized existing data for each site along with other information compiled by E&E during its file searches of various agencies and organizations. It contains data from investigations conducted by Clayton Environmental Consultants, Dynamac, E&E, Illinois EPA, Geraghty and Miller, Reidel Industrial Waste Management, Russell and Axon, and U.S. EPA.

In January and May 2000, Solutia collected groundwater samples from selected existing monitoring wells to determine the areal and vertical distribution of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) in the groundwater between its W.G. Krummrich Plant and the Mississippi River. Surface water, sediment, and fish sampling conducted in the Mississippi River in October and November 2000, demonstrated that groundwater releases to surface water in the vicinity of site R adversely impacted the Mississippi River.

In October and November 2000, U.S. EPA collected sediment samples in the Mississippi River in and adjacent to the area of a suspected groundwater release from Solutia's W.G. Krummrich plant. This work was performed in conjunction with Solutia's implementation of its Surface Water Sampling Plan.

On November 24, 2000, the U.S. EPA and Area 2 Site Potentially Responsible Party (PRP) group signed an administrative order on consent requiring to the completion of a Remedial Investigation/Feasibility Study (RI/FS AOC) by the PRPs.

In June 2001, Solutia conducted a Baseline Ecological Risk Assessment in the area of the

Mississippi River adjacent to site R to assess the groundwater's impact on aquatic life in that area.

On September 13, 2001, U.S. EPA proposed adding the Area 2 Site to the National Priorities List (NPL) of Superfund sites. Sites on the list are eligible for further investigation and cleanup under the federal Superfund program.

On November 14, 2001, U.S. EPA sent a request pursuant to the RI/FS AOC to the Site PRP Group to prepare a Focused Feasibility Study (FFS) to address the known groundwater contamination problem in the vicinity of site R. The request was made based on information collected by Solutia and U.S. EPA in 2000 and 2001.

B. Record of Decision

The Ecological Risk Assessment done in June 2001 for site R revealed that fish species in the Mississippi adjacent to site R are at risk from exposure to contaminated sediment, and that fish prey are at risk from exposure to surface water. A number of compounds found in the sediment and surface water adjacent to site R were also found in fish tissue. As a result, U. S. EPA determined that an actual or threatened releases of hazardous substances was present at the Site, which, if not addressed by implementing an appropriate response action, may present an imminent and substantial endangerment to public health, welfare, or the environment. On September 30, 2002, the U.S. EPA issued its Interim ROD with a selected interim remedy for Operable Unit 2 (OU-2), along with a Unilateral Order to Solutia requiring its implementation, pursuant to its authority under CERCLA. The Interim ROD and order called for the following actions to mitigate releases in the area of concern:

- Installation of a 3,500 foot long, 140 foot deep "U"- shaped physical barrier between the down gradient boundary of site R and the Mississippi River;
- Installation of groundwater extraction recovery wells inside the barrier wall;
- Installation of a groundwater treatment system;
- Implementation of a groundwater, surface water, and sediment monitoring program to ensure acceptable performance of the interim groundwater remedy; and
- Institutional Controls

The selected remedy is considered an interim remedial action for the groundwater operable unit (OU-2) at the Site. This limited-scope action is intended only to address the release of contaminated groundwater into the Mississippi in the vicinity of site R. A final response action to address fully any additional threats posed by conditions at the Site will be evaluated upon

completion of the Area 2 Site RI/FS.

III. Basis for the Document

During the preparation of the FFS for the proposed Interim Groundwater Remedy at site R, a number of general response actions were evaluated. These included both physical and hydraulic barriers. More particularly, two types of physical barriers, slurry walls and jet grouted walls, were selected for screening. Based on an evaluation of the technologies, at least as they were understood at the time, the use of a slurry wall as a physical barrier was screened out from further consideration. The specific areas of uncertainty identified with the use of this technology were:

- The ability to reliably construct the wall to a depth of 140 feet below surface;
- The ability to key the wall into the bedrock; and
- The ability to use the excavated soil as backfill in the slurry trench

These uncertainties, particularly the latter concern about the use of the excavated soil as backfill, were judged to be significant enough to preclude the slurry technology from further consideration in the assembly of remedial alternatives. Jet grouting technology appeared to offer less uncertainties, primarily because the spoil produced by the construction operation was expected to be much less than that produced by a slurry wall. Consequently, the problem of disposal of large volumes of spoils was not expected to be significant if jet grouting was used to construct the barrier. Accordingly, the preferred remedial alternative included the construction of a jet grouted barrier wall and this alternative was selected in the Interim ROD.

In March 2003, Solutia's bids were solicited from a number of specialist contractors for the construction of the barrier wall using jet grouting techniques. One of these contractors submitted an alternate bid based on the use of conventional soil-bentonite slurry wall techniques and was able to demonstrate to the PRP's satisfaction that such construction was feasible. On April 24, 2003, Solutia submitted to the U.S. EPA a Technical Memorandum regarding the implementation of slurry wall construction. This Technical Memorandum is available as part of the Administrative Record. This system appears to offer at least as much and perhaps even more certainty about the integrity of the finished product as jet grouting.

Each of the issues identified above and a discussion of the advantages offered by the use of the conventional slurry wall construction techniques are addressed below:

Slurry Wall Depth

One of the major issues in successfully constructing a deep slurry wall is the ability to maintain a stable trench over a long distance and to keep the trench bottom and long back slope free of debris. This requires the careful design of the slurry mix and the selection of the right equipment for the excavation of the slurry trench.

Solutia has performed a stability analysis for the trench proposed for the Site and has concluded that it will be stable as long as the slurry density exceeds a critical value of 70 pounds per cubic foot (lb/cu.ft.). On this basis, Solutia has recommended that the slurry mix be designed to provide a density of 78 lb/cu.ft. This density will be achievable with soils in the project area.

Solutia proposes to use some of the most advanced and innovative equipment available for construction of the slurry walls. The proposed construction method will involve the use of a backhoe with a 108 foot long boom to excavate the trench to a depth of 80 to 90 feet below surface. Below this depth to the required depth of 140 feet, Solutia proposes to advance the trench using a hydraulically operated clamshell bucket. This equipment was recently used to install a slurry wall to a depth of 195 feet in New York.

Bedrock Contact

The slurry wall proposed for this project will sit directly on the top of the rock, in the same way that the current design for a jet grout wall terminates the wall on the top of the rock. As such, the hydraulic performance of the slurry wall will be equivalent to that of the jet grouted wall. One of the factors influencing the success of a slurry wall installed to the top of rock is the ability to clean the bottom of the trench (top of rock) prior to backfilling. The clamshell proposed for use on this project is particularly suited to this task.

Use of Excavated Soil for Trench Backfill

At the time that FFS was prepared, it was not known whether the excavated soil could be used as backfill for the slurry trench. Since that report was prepared, however, an extensive compatibility testing program has been completed. The results of that testing program demonstrate that the soils excavated during the construction of the slurry trench can be used as backfill without compromising the long term performance of the slurry wall.

IV. Description of Significant Differences or New Alternatives

This ESD discusses the proposed use of a conventional soil-bentonite slurry wall barrier to be constructed down gradient of site R, as an alternative to the jet grout wall barrier specified in the Interim ROD. This modification will not alter the scope of the remedy selected in the September, 2002 ROD.

The advantage of using the soil-bentonite slurry wall as an alternative to the jet grout wall are listed below. These advantages are based on new information (discussed in detail in Section III above) which was not available at the time the FFS was developed. Most significantly, the expected volume of spoil generated was a primary reason that a slurry wall was not selected previously.

- Construction of the slurry walls using soil-bentonite slurry trench is an improved

technology that has been used all over the world for decades. The design principles are well understood and the technology and equipment have been proven. Consequently, the ability to successfully construct a slurry wall is much less dependent on proprietary process and equipment than is the case for walls constructed with jet grouting.

- Control of the geometry of the slurry trench, in terms of its penetration depth, and vertical, and horizontal alignment is more easily controlled than for a jet grouted wall.
- The volume of surplus spoil generated from the construction of the slurry wall will be minimized. It is estimated that a slurry wall will result in a surplus spoil volume less than 5,000 cubic yards, as compared to approximately 30,000 cubic yards expected from the construction of a jet grouted wall.
- The use of conventional soil-bentonite slurry trench techniques for construction of the cut-off wall will be more cost-effective than jet grouting (15 to 20 percent less expensive).
- The project area's subsurface conditions (volume of groundwater movement to the Mississippi River) are more likely to hamper jet-grouting as opposed to slurry wall construction because high groundwater velocities can disperse the grout down gradient away from the intended wall location. However, the flow velocities in the Sauget flood plain are not unusually high, so this effect may not be significant.
- The Slurry wall should be able to get better contact between the wall and the underlying bedrock because the clamshell will be vigorous enough to remove much of the weathered and fractured limestone that lies above the more competent (unweathered) limestone. Jet grouting would be more likely to misinterpret weathered limestone or large boulders as a competent bedrock, resulting in a less than satisfactory contact with true unweathered bedrock. The nature of the contact between the barrier wall and competent bedrock is the key factor in controlling groundwater flow in the project area.

V. Support Agency Comments

The State of Illinois was consulted regarding these changes and has reviewed this ESD. The State agrees that the modifications to the selected remedy are necessary and appropriate.

VI. Statutory Determinations

The remedy described in this ESD satisfies CERCLA Section 121, remains protective of human health and the environment, complies with federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. Specifically, although the construction of the slurry wall will be completed, weather permitting, approximately six months after the expected completion date for the jet grout wall (July 16, 2003), Solutia's activation of

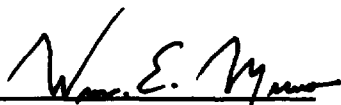
groundwater extraction system and groundwater treatment in the vicinity of site R will minimize groundwater impacts to the Mississippi River during the slurry wall construction period.

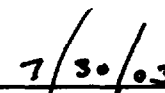
Summary Table

Differences	Slurry Wall	Jet Grout Wall
Nature of Work	improved technology, geometry of trench is easily controlled, better contact with bedrock	depends on process and equipment, geometry of wall hard to control, harder to clean bedrock surface
Volume of Surplus Spoil	less than 5,000 cubic yards	30,000 cubic yards
Cost	15 to 20 % Less Expensive	Approximately \$ 7,000,000
Schedule	January 16, 2004, but with activation of groundwater extraction system and groundwater treatment in the vicinity of site R by July 15, 2003	July 16, 2003
Similarities	groundwater extraction and treatment system, monitoring program, wall depths, and institutional controls	

VII. Public Participation Compliance

This ESD and copies of other documents related to the Sauget Area 2 Site are available at the Cahokia Public Library District, 140 Cahokia Park Drive, Cahokia, Illinois and at the U.S. EPA Region 5 Record Center located at 77 W. Jackson Boulevard, Chicago, Illinois.


William E. Muno, Director
Superfund Division


Date